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EXAMINER

MENON, KRISHNAN S

ART UNIT PAPER NUMBER

1723

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/856,460

Applicant(s)

LESCUYER ET AL.

Examiner

Krishnan S. Menon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on appeal brief of 4/8/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Claims 1-7, 9 and 11 are pending as of appeal brief of 4/8/05.

Prosecution Reopened

In view of the appeal brief filed on 4/8/05, PROSECUTION IS HEREBY REOPENED.

New grounds for rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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Claims 1-7, 9 and 11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The recitation in claims 1 and 9, "formed from grains having open porosity between 5 and 30%" is considered new matter because the specification and claims as originally filed discloses (in page 2, lines 18-21) porosity as corresponding to 'porous volumes of the grains of the bed (surface porosities and internal porosities)', and the surface porosities could include porosity that is on the surface of a particle as well as between the particles. 'Particulate material "formed from grains having open porosity between 5 and 30%"' does not seem to have support in the specification or claims as originally filed.

Claims 1-7,9 and 11 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Claims recite "...bed of refractory particulate material formed from grains having an open porosity between 5 and 30%." However, Electrofused corundum and the method of preparing the "*bed of refractory particulate material formed from grains having an open porosity between 5 and 30%*", critical or essential to the practice of the invention, but not included in the claim(s), is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Applicant in the second supplemental appeal brief of 4/8/05 in the paragraph linking pages 9 and 10 stresses:

"the electrofused corundum must be prepared in such a way that the desired open porosity is obtained. There is no disclosure or suggestion in the Neidhardt et al reference that the electrofused corundum should be prepared in a manner that results in an open porosity of 5 to 30%. [emphasis added].

However, the application disclosure (specification and original claims) does not provide sufficient information on how to obtain the recited refractory material (corundum) formed from grains having open porosity between 5 and 30%. Specification page 3 lines 6-19 discloses that the refractory material is obtained by fusing alumina in an arc oven, followed by casting, adjusting the cooling and solidification state in order to obtain the desired open porosity, and that crystallization modifiers such as F,B,Y,MgO or SiO₂ may be added to control the porosity. Page 6 lines 18-20 provide a cooling and solidification rate of 50-100 deg. C/Hr. However, the specification does not disclose the melting and casting temperature, the specific composition of the alumina mix, length of time, atmosphere and other conditions to conduct the process. If the electrofused corundum must be prepared in a way that the desired open porosity is obtained, details of such a preparation is not disclosed for one of ordinary skill in the art to practice the invention without undue experimentation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1,4-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al (US 3,172,757) in view of Neidhardt et al (US 4,177,235).

Claims 1: Hess teaches a process of filtering a molten metal using a bed of refractory particulates - see figures, col 2 lines 40-54. Hess does not teach the porosity of the particles in the bed. Neidhardt teaches corundum made by the same method as that of the applicant (cooling and crushing of electrofused corundum), and therefore, inherently would have the same porosity, as claimed (column 1 line 60 – column 4 line 18: electrofusing alumina with additives such as SiO₂ or MgO, casting in molds, cooling at controlled rate, crushing, roller mill). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Neidhardt in the teaching of Hess to have pure α corundum for higher material density for keeping the particles down gravitationally during operation, melting point and crush resistance as required by Hess (col 2 lines 40-45).

Claim 4: Hess teaches particle size 6-20 mm ($\frac{1}{4}$ - $\frac{3}{4}$ in. see col 3 lines 64-68), and bed thickness as about 5 in, which falls in the range claimed (col 6 lines 1-10).

Claim 5: particles are corundum – see col 2 lines 44-47.

Claim 6: liquid metal is aluminum or aluminum alloy – column 1 lines 15-17.

Claim 7: method of making the corundum particles is taught by Neidhardt – see abstract and col 3 line 27 – col 4 line 33.

Claim 9: Hess teaches a filtration device for liquid metal having corundum (col 2 lines 40-54, figures), but does not teach the porosity of the corundum. Neidhardt

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teaches corundum made by the same method as that of the applicant, and therefore, inherently would have the same porosity. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Neidhardt in the teaching of Hess to have pure α corundum for sufficient density, higher melting point and crush resistance as required by Hess (col 2 lines 40-45) in the selection of the material for the media. [T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

2. Claims 1,2,4-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brondyke et al (US 2,863,558) in view of Neidhardt et al (US 4,177,235).

Claims 1: Brondyke teaches a process of filtering a molten metal using a bed of refractory particulates - see figures, col 2 lines 19-72. Brondyke does not teach the porosity of the particles in the bed. Neidhardt teaches corundum made by the same method as that of the applicant (cooling and crushing of electrofused corundum), and therefore, inherently would have the same porosity, as claimed (column 1 line 60 – column 4 line 18: electrofusing alumina with additives such as SiO₂ or MgO, casting in

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molds, cooling at controlled rate, crushing, roller mill). It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Neidhardt in the teaching of Brondyke to have pure α corundum for higher material density for keeping the particles submerged in the melt during operation, melting point and crush or attrition resistance as required by Brondyke (col 2 19-40).

Claim 2: residence time in the bed: see column 6 lines 1-23. 113 sq.in of bed cross-section, 8" bed depth, and 350 Kg/min of flow rate. If molten Al density is 2g/cc, this would relate to a residence time of 11 seconds.; 6 seconds if the density is 1 g/cc, or about 20 seconds if density is the same as that of solid Al at 2.7g/cc. Thus data in the reference falls within the range of 1-500 seconds.

Claim 4: Brondyke teaches particle size 3-14 mesh (col 2 lines 64-68), and bed thickness as about 8 in, which falls in the range claimed (col 6 lines 1-12).

Claim 5: particles are corundum – see col 2 lines 25.

Claim 6: liquid metal is aluminum or aluminum alloy – column 1 lines 15-17.

Claim 7: method of making the corundum particles is taught by Neidhardt – see abstract and col 3 line 27 – col 4 line 33.

Claim 9: Brondyke teaches a filtration device for liquid metal having corundum (col 2 lines 19-40, figures), but does not teach the porosity of the corundum. Neidhardt teaches corundum made by the same method as that of the applicant, and therefore, inherently would have the same porosity. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Neidhardt in the teaching of Brondyke to have pure α corundum for sufficient density, higher melting point and crush

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resistance as required by Brondyke (col 2 lines 19-40) in the selection of the material for the media. [T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

3. Claims 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hess et al (US 3,172,757 in view of Neidhardt et al (US 4,177,235).as applied to claim 1 above and further in view of Brezny (US 5,322,821).

Claims 3 and 11 differ from the teaching of Hess in view of Neidhardt in the recitation of the pore size. Brezny teaches refractory metal particles for filtering molten metals having pore sizes from 0.01 – 200 microns. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Brezny in the teaching of Hess and Neidhardt because Brezny provides improved surface area and interconnected pores for improved filter capacity (see Brezny col 2 lines 8-47).

Response to Arguments

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In response to the argument that presently claimed open porosity is not inherently present in the Neidhardt ref, it is respectfully pointed out that according to the argument, electrofused corundum **must be** prepared in such a way that the desired open porosity is obtained, which means, the method is essential for the invention. The Neidhardt ref provides the method in sufficient detail as claimed (claims 5 and 7), and therefore, the corundum as made by the Neidhardt method would inherently have the porosity claimed.

Conclusion

This action is made non-final because of the new grounds for rejection of claims 2,3,6 and 11.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Krishnan S. Menon
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7/11/05



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